ENERGY MAP OF ALGERIA

(2nd Edition)

Researched and Produced by the Petroleum Economist Ltd., London, in association with

سوناطراك

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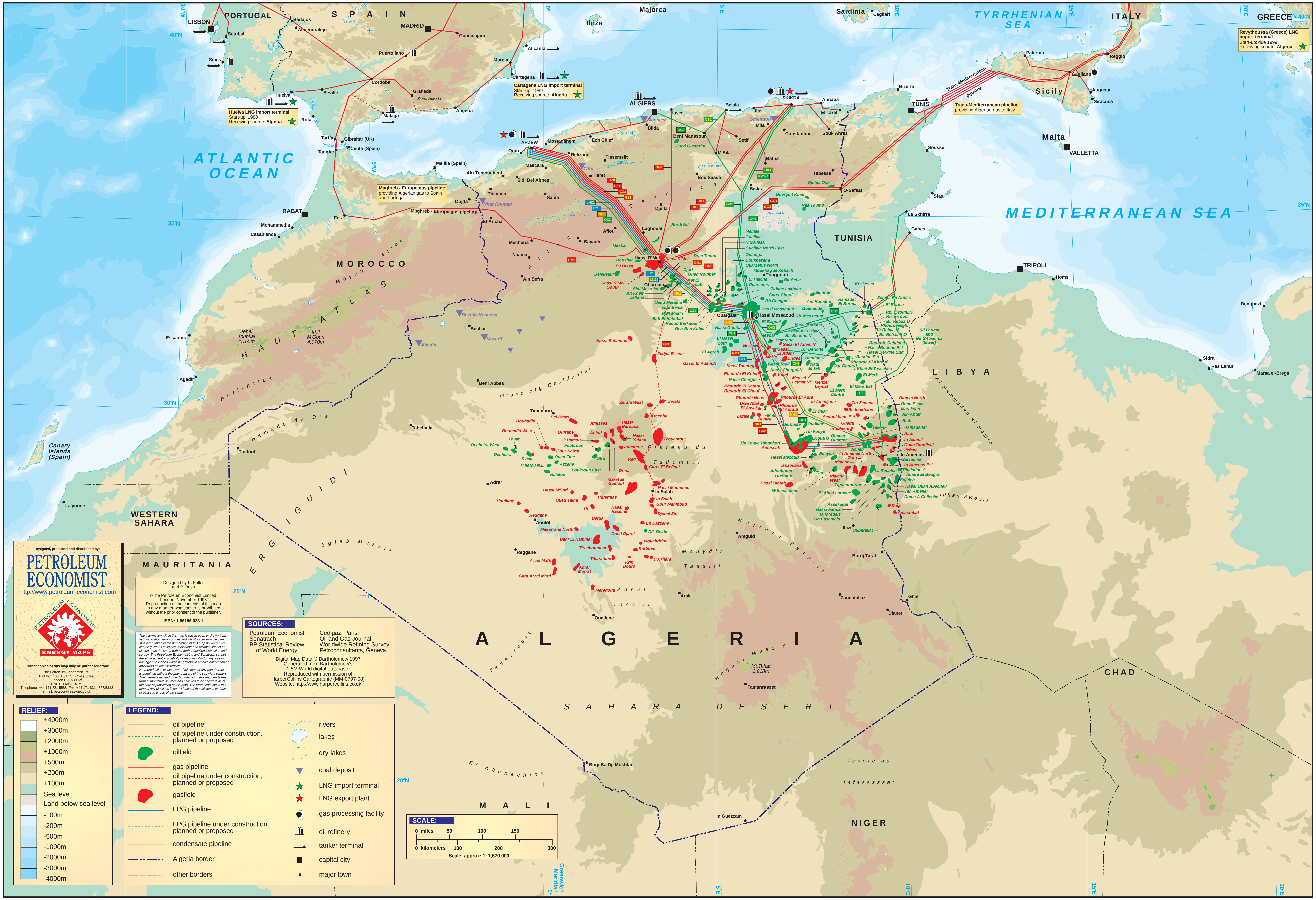

Huelva LNG import terminal
Start-up: 1988
Receiving source: **Algeria**

Cartagena LNG import terminal
Start-up: 1989
Receiving source: **Algeria**

Revythoussa (Greece) LNG import terminal
Start-up: due 1999
Receiving source: **Algeria**

Trans-Mediterranean pipeline
providing Algerian gas to Italy

Maghreb - Europe gas pipeline
providing Algerian gas to Spain and Portugal

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Designed by K. Fuller
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SOURCES:

Petroleum Economist
Sonatrach
BP Statistical Review of World Energy
Cedigaz, Paris
Oil and Gas Journal, Worldwide Refining Survey
Petroconsultants, Geneva

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RELIEF:

- +4000m
- +3000m
- +2000m
- +1000m
- +500m
- +200m
- +100m
- Sea level
- Land below sea level
- -100m
- -200m
- -500m
- -1000m
- -2000m
- -3000m
- -4000m

LEGEND:

- oil pipeline
- oil pipeline under construction, planned or proposed
- oilfield
- gas pipeline
- oil pipeline under construction, planned or proposed
- gasfield
- LPG pipeline
- LPG pipeline under construction, planned or proposed
- condensate pipeline
- Algeria border
- other borders
- rivers
- lakes
- dry lakes
- ▼ coal deposit
- ★ LNG import terminal
- ★ LNG export plant
- ● gas processing facility
- oil refinery
- tanker terminal
- ■ capital city
- • major town

SCALE:

0 miles 50 100 150
0 kilometers 100 200 300
Scale: approx; 1: 1,670,000

OIL AND GAS INFRASTRUCTURE AND PRODUCTION:

GAS PIPELINES:

From / To	Code	Diameter	Length (km)	Date
Hassi R'Mel - Arzew	GZ0	24"/20"	509	1961
Hassi R'Mel - Arzew	GZ1	40"	507	1976/79
Hassi R'Mel - Arzew	GZ2	40"	507	1982
Hassi R'Mel - Arzew	GZ3	42"	507	1989
Hassi R'Mel - O. Safsaf	GO1	48"	549	1982
Hassi R'Mel - O. Safsaf	GO2	48"	549	1986
Hassi R'Mel - Skikda	GK1	40"	573	1971/78
Hassi R'Mel - Isser	GG1	42"	436	1981
Alrar - Hassi R'Mel	GR1	42"/48"	956	1987
Gassi Touil - Hassi Messaoud	GM1	40"	150	1976
Hassi R'Mel - Skikda	GK2	42"	573	1996
Hassi R'Mel - EUROPE	GME	48"	521	1996
Alrar - Hassi R'Mel	GR2	42"/48"	962	1996
Teguentour - Hassi R'Mel	GIS	42" or 48"	526	Project

OIL PIPELINES:

From / To	Code	Diameter	Length (km)	Date
Haoud El Hamra - Arzew	OZ1	28"	801	1965
Haoud El Hamra - Skikda	OK1	34"	637	1972
Haoud El Hamra - Bejaia	OB1	24"/22"	660	1959
Beni Manssour - Algiers	OG1	16"	131	1971
In Amenas - La Skhirra (Tunisia)	OT1	24"	265	1960
El Borma - Mesdar	OD1	20"	272	1977
In Amenas - Haoud El Hamra	OH1	30"	630	1983
Mesdar - Haoud El Hamra	OH2	26"	108	1972

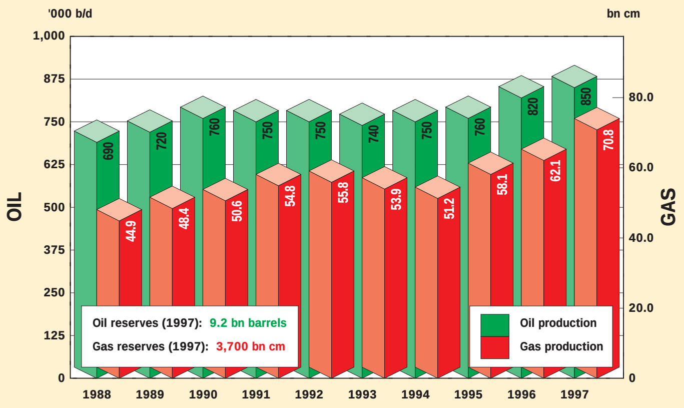
CONDENSATE PIPELINES:

From / To	Code	Diameter	Length (km)	Date
Hassi R'Mel - Arzew	NZ1	28"	506	1978
Ohanet - Haoud El Hamra	NH2	30"	518	1961
Hassi R'Mel - Haoud El Hamra	NH1	8"	306	1960

LPG PIPELINES:

From / To	Code	Diameter	Length (km)	Date
Haoud El Hamra - Arzew	LNZ1	12"/16"	801	1973
Hassi R'Mel - Arzew	LZ1	24"	504	1983
Alrar - Hassi R'Mel	LR1	10"/24"	988	1996

ALGERIA: OIL AND GAS PRODUCTION



Oil reserves (1997): 9.2 bn barrels

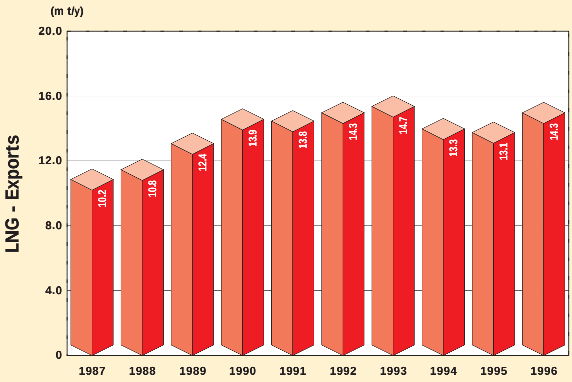
Gas reserves (1997): 3,700 bn cm

REFINERIES:

Sonatrach -	Capacity (b/d)
Algiers	60,420
Arzew	56,240
Hassi Messaoud	23,750
In Amenas	7,000
Skikda	335,350
Total	***482,760***

ALGERIA'S LNG INDUSTRY:

ALGERIA: LNG EXPORTS



LNG EXPORT CONTRACTS:

Purchaser:	Amount (t/y):	Contract (yr):	Start:	Remarks:
Distrigaz (Belgium)	3.33m		1982	Signed in 1975 (option 2013)
Gaz de France (France)	0.39m		1965	+10 yrs in 1991
Gaz de France (France)	3.81m		1982	+10 yrs in 1991
Gaz de France (France)	2.59m		1976	+15 yrs in 1991
Gaz de France (France)	0.79m	10	1992	Signed in 1991
Enagas (Spain)	2.40m		1978	Up to 2.8m t/y in 2002 - option 2013
Botas (Turkey)	2.96m	19	1994	Signed in 1988 (+1bn cm in 1996)
Distrigas (US)	0.89m		1978	Revised in 1988 (+end of 'Boeing Deal')
Panhandle (US)	0.59m	16	1989	Signed in 1988 (up to 4.05bn cm in total)
Snam (Italy)	1.33m	16	1997	Signed in 1994
	Existing (1997) 19.10m			
Depa (Greece)	0.52m	15	1998	Signed in 1988
	Future (1998+) 0.52m			

ALGERIA'S LNG LIQUEFACTION PLANTS:

ARZEW GL1Z

Start-up: **1978**
Operator: **Sonatrach**
Shareholders: **Sonatrach (100%)**
Capacity (m t/y): **8.8**
No. of trains: **6**
Process method: **APCI**
Gas fields: **Hassi R'Mel**
Note: Renovation programme by Bechtel is nearing completion. Capacity will now be 12.1bn cm/y, up from 10.5bn cm/y.

ARZEW GL2Z

Start-up: **1981**
Operator: **Sonatrach**
Shareholders: **Sonatrach (100%)**
Capacity (m t/y): **8.8**
No. of trains: **6**
Process method: **APCI**
Gas fields: **Hassi R'Mel**
Note: Upgraded by Kellogg in 1996, it now has a capacity of 12.1bn cm/y, up from it's original design capacity of 10.5bn cm/y.

ARZEW GL4Z (CAMEL)

Start-up: **1964**
Operator: **Sonatrach**
Shareholders: **Sonatrach (100%)**
Capacity (m t/y): **1.1**
No. of trains: **1**
Process method: **Technip**
Gas fields: **Hassi R'Mel**
Note: The oldest LNG plant in the world.

SKIKDA GL1K PHASE I

Start-up: **1972**
Operator: **Sonatrach**
Shareholders: **Sonatrach (100%)**
Capacity (m t/y): **2.8**
No. of trains: **3**
Process method: **Technip**
Gas fields: **Hassi R'Mel**
Note: Gaz de France and it's Sofregaz subsidiary, upgraded two trains by March 1997. Kellogg is renovating the remaining trains, with completion by mid 1998. Capacity will be raised to 8.2bn cm/y from the design figure of 8.0bn cm/y.

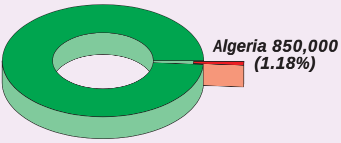
SKIKDA GL1K PHASE II

Start-up: **1981**
Operator: **Sonatrach**
Shareholders: **Sonatrach (100%)**
Capacity (m t/y): **3.0**
No. of trains: **3**
Process method: **Prico**
Gas fields: **Hassi R'Mel**

WORLD OIL AND GAS

WORLD'S TOP 50 OIL PRODUCERS (1997):

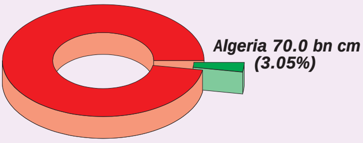
Rank:	Country:	Production ('000 b/d):
1	Saudi Arabia	8,345
2	USA	8,290
3	Russian Federation	6,120
4	Iran	3,630
5	Mexico	3,410
6	Norway	3,280
7	China	3,190
8	Venezuela	3,180
9	Canada	2,540
10	United Kingdom	2,510
11	Nigeria	2,280
12	UAE	2,250
13	Kuwait	2,105
14	Libya	1,420
15	Indonesia	1,360
16	Brazil	1,150
17	Iraq	1,150
18	Egypt	920
19	Oman	910
20	Argentina	880
21	***Algeria***	***850***
22	India	760
23	Malaysia	750
24	Angola	730
25	Colombia	670
26	Australia	640
27	Qatar	620
28	Syria	560
29	Kazakhstan	521
30	Ecuador	380
31	Gabon	370
32	Yemen	370
33	Congo	244
34	Denmark	229
35	Brunei	199
36	Azerbaijan	189
37	Vietnam	181
38	Ukraine	165
39	Romania	138
40	Trinidad	133
41	Peru	132
42	Cameroon	124
43	Tunisia	108
44	Italy	107
45	Turkmenistan	106
46	Papua New Guinea	80
47	Thailand	79
48	New Zealand	70
49	Turkey	67
50	Hungary	60



World Total
72,076,000 b/d

WORLD'S TOP 50 GAS PRODUCERS (1997):

Rank:	Country:	Production (bn cm):
1	Former Soviet Union	668.2
2	USA	536.9
3	Canada	165.6
4	United Kingdom	91.8
5	Netherlands	81.8
6	***Algeria***	***70.0***
7	Indonesia	67.2
8	Iran	45.4
9	Norway	45.3
10	Saudi Arabia	43.4
11	Malaysia	38.4
12	Mexico	30.2
13	Australia	29.6
14	Venezuela	28.3
15	Argentina	27.4
16	Abu Dhabi	25.2
17	India	23.5
18	China	21.2
19	Germany	21.1
20	Pakistan	19.8
21	Italy	19.5
22	Qatar	17.9
23	Romania	15.2
24	Thailand	14.8
25	Egypt	13.5
26	Kuwait	9.4
27	Trinidad	9.3
28	Brunei	9.2
29	Sharjah	8.7
30	Denmark	7.9
31	Bangladesh	7.6
32	Bahrain	6.6
33	Libya	6.6
34	Brazil	5.5
35	Nigeria	5.5
36	New Zealand	5.0
37	Colombia	5.0
38	Hungary	4.4
39	Oman	4.3
40	Syria	4.1
41	Iraq	3.6
42	Poland	3.2
43	Bolivia	3.2
44	France	2.7
45	Tunisia	2.7
46	Ireland	2.5
47	Chile	2.1
48	Japan	2.1
49	Dubai	1.9
50	South Africa	1.8



World Total
2,298.3 bn cm